ICT Update
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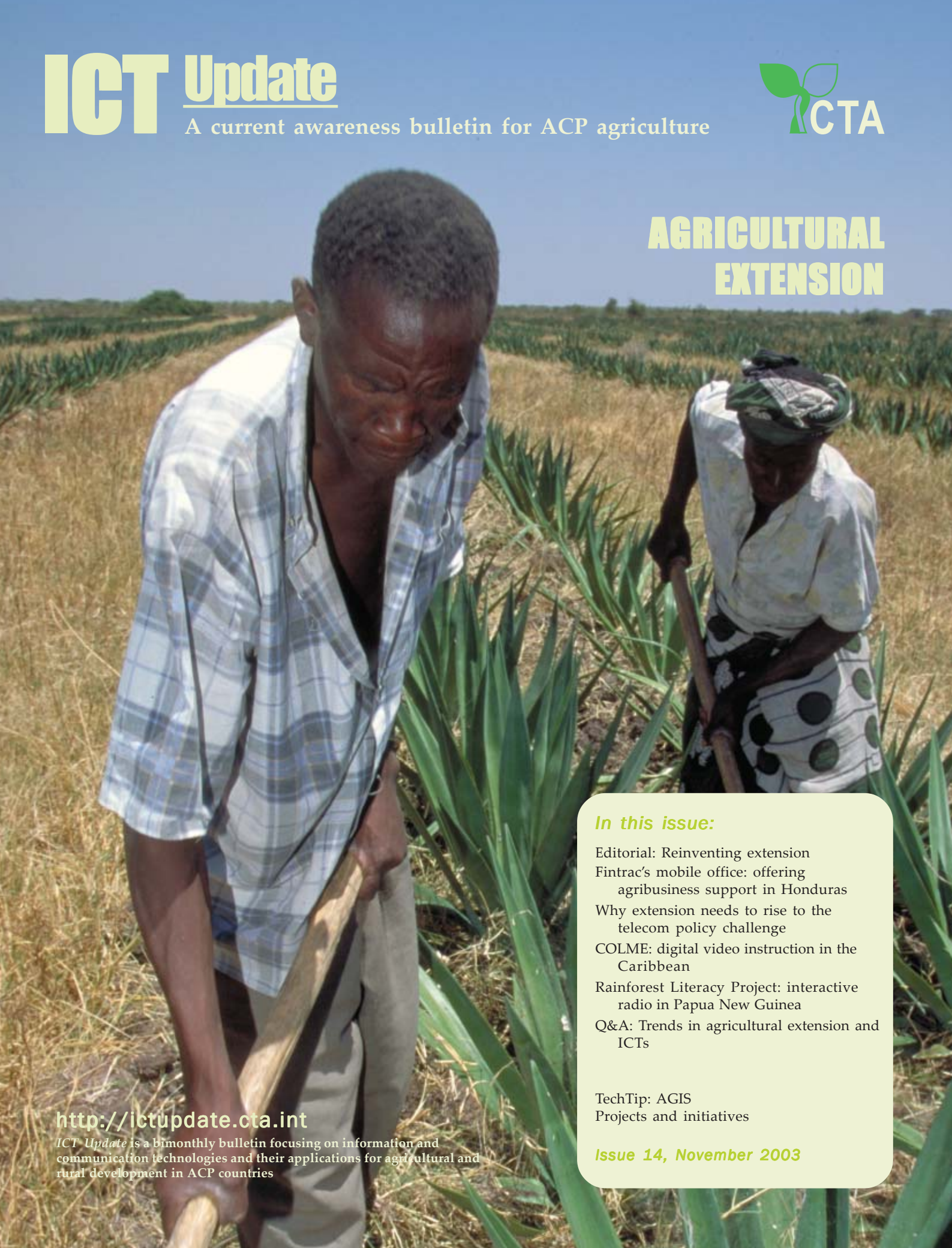
CTA

AGRICULTURAL EXTENSION



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http://ictupdate.cta.int
ICT Update is a bimonthly bulletin focusing on information and communication technologies and their applications for agricultural and rural development in ACP countries

Editorial

Reinventing agricultural extension: ICTs are only part of the solution.

For decades agricultural extension was considered the prime vehicle for bringing technological innovation to farms. However, pitching an effective 'extension strategy' appeared to be difficult. Various extension approaches were developed over the years, each with a different focus: opinion leaders, farmers' groups, training & visit (T&V) and, most recently, knowledge management. In the discussions about the pros and cons of these various approaches, agricultural policy makers and administrators seemed to have forgotten the very people they wish to support – the farmers.

Today, it is sometimes said that agricultural extension is 'dead' – squeezed by decentralization policies, reduced public funding and privatization of government services. However, agricultural policy makers hope that ICTs will provide unique opportunities to make a fresh start in providing farmers with the information they need. CTA has entered the policy discussion on ICTs and agricultural extension. In September 2003 the Centre devoted its annual ICT Observatory workshop to exploring the question 'ICTs – transforming agricultural extension?'

This issue of *ICT Update* highlights various projects that are pioneering the use of ICTs and, in the process, are reinventing the traditional ways of doing agricultural extension. These ground-breaking projects show that ICTs can indeed help extension workers to broaden the range and increase the quality of their services that meet the information needs of farmers. However, they also show that ICTs are no 'magic bullet', and can only work if they are firmly embedded in new extension strategies that go far beyond the narrow current focus of 'technology transfer'. Although the number of such initiatives is still small, their results are highly relevant because they show policy makers and administrators what can (and what can't) be achieved. Many more such imaginative projects are required (and the 'lessons learned' published!). Only their results can provide adequate information on the potential of ICTs to support new agricultural extension strategies and more effective extension services.

The accompanying web magazine provides annotated links to many relevant project initiatives and other web resources and, in a special section, the materials that were presented during the workshop.

ICT Update

ICT Update is a bimonthly printed bulletin, a web magazine *(http://ictupdate.cta.int)*, and an accompanying email newsletter. Each issue focuses on a specific theme relevant to ICTs for agricultural and rural development in African, Caribbean and Pacific (ACP) countries, and features three commissioned articles. The printed bulletin also contains a selection of relevant links and projects and a 'Question and Answer' section, taken from the website. Readers are invited to contribute to the site by adding links to online resources on a particular theme. Simply log on to the *ICT Update* website, and click on one of the 'submit' options in the right-hand column. The next issue of *ICT Update* will be available on 5 January 2004.

TechTip

AGIS: presenting the Agricultural Geo-referenced Information System for South Africa.

Suppose you are an extension officer and you need information about the boundaries of a farm or on the soil properties in a particular district – life would be a lot easier if you could retrieve these data at will. Enter the Agricultural Geo-referenced Information System (AGIS), which has been developed in and for South Africa. At the core of this CTA-sponsored information service are several geo-referenced databases that can be used to store, query and display physical, social and economic information crucial to agricultural planning and decision making. These databases contain interactive maps, graphs, text and pictures describing the variability of South Africa's natural agricultural resources in terms of geomorphology, climate, soil and vegetation, as well as land use, agricultural industries and general socio-economic conditions. AGIS offers unprecedented potential to deliver information to agricultural extension officers working in rural communities, and is increasingly considered as an important tool for integrated and sustainable rural development in South Africa.

AGIS land capability map

AGIS resulted from the combined efforts of the National and Provincial Departments of Agriculture and the Agricultural Research Council. The initiative strives to integrate the economic, social and biophysical information required to support sustainable agricultural development into a single demand-driven information system. Although still in its infancy, AGIS offers a single point of entry to comprehensive, integrated and up to date agricultural information as well as decision support systems.

Using the Internet as well as off-line CD libraries, AGIS provides an interface for agricultural decision makers, scientists, the staff of rural information centres, extension officers and the farming community to support their day-to-day activities. Decision support tools currently under development include a risk management system, long-term and monthly grazing capacity data, and a food insecurity and vulnerability mapping system, as well as the functionality to guide users through certain decision-making processes. In the future, specialist user support will be provided through an electronic question and answer service, linked to South Africa's extensive network of agricultural scientists and researchers.

For more information contact **Hein Lindemann** (email: *heinl@nda.agric.za*), or visit *www.agis.agric.za*.

Fintrac's mobile office: offering agribusiness support in Honduras

Charles Mahoney describes how Honduran extension officers have been equipped with a wide range of ICTs to support smallholder farmers after the devastation caused by Hurricane Mitch.

Imagine this: extension workers and technicians who go around the country in mobile offices equipped with a wide range of top-notch ICTs such as a global positioning system (GPS) device, digital cameras and laptops. With this equipment they have immediate access to vital agricultural information and can make recommendations to farmers on the spot. As a result, the technicians are able to spend 95% of their time in the field instead of the office, providing direct technical assistance to farmers. This is not a distant future scenario, but is already happening in Honduras, where staff of the US-based agribusiness development consultancy Fintrac are working to increase sales of non-traditional horticultural produce and boost the incomes of smallholder farmers.

It all started in 2000, when the USAID-funded Center for Developing Agribusiness (CDA) took on the task of revitalizing the Honduran non-traditional agricultural sector after the devastation caused by Hurricane Mitch. Fintrac, which has a long track record in providing technical assistance in the Caribbean and Africa, was called upon to support farmers, food processors, exporters, and allied agribusinesses all along the farm-to-market chain. Its task is to manage knowledge, monitor and evaluate client farmers, disseminate technical information, and make market research data and information available to field technicians and clients. The programme collaborates with 500 'lead partners', and provides direct services to a further 5000 small farmers, focusing on improving production and post-harvest systems, market linkages, and infrastructure. To ensure the smooth operation of all the different information channels, the innovative use of ICTs has been decisive.

While implementing the CDA programme in Honduras, Fintrac designed its own field-based management information system to provide real-time feedback from field staff on individual clients. The system is used to track technical assistance delivered, follow-up actions required, impacts and results, training, and investments. From their mobile offices, CDA's field agronomists and other technicians enter this information into a database using a laptop, and submit it via the Internet for posting on Fintrac's intranet. In addition to a laptop, CDA technicians also typically have at their disposal a GPS device, which is used to map farm boundaries, topography, and irrigation systems, as well as digital cameras, portable printers, cell phones, portable weather stations, and floppy disk drives.

A Fintrac field technician at work in his mobile office, which is equipped with a wide range of top-notch ICTs such as a global positioning system (GPS) device, digital cameras and laptops.

'Technology is an important part of our work,' says Andrew Medlicott, Fintrac's Latin American Director. 'The information technology we use captures almost all of the activities and results in the field, based on which we can generate reports and data. The growers see the difference with the immediate delivery of analyses and recommendations. In most technical assistance programmes field staff record information and deliver it a week later after returning to their office. But a week is a long time in agriculture – it can mean the difference between profit and loss'.

Fintrac has taken these ICT innovations and improved on them. In September 2003 the company launched new proprietary software, called the Client Impact and Results Information System (CIRIS), which has been designed specifically for agribusiness development programmes. The system's reporting capabilities will enable an improved level of technical communication between Fintrac staff throughout Honduras and elsewhere. At the client level, not only will field technicians be able to access individual client data and follow-up technical assistance requirements, as is currently the case, they will also be able to view recommendations made by other field staff on a crop-specific basis across the world. With CIRIS, all Fintrac laptops will have fully replicated versions of the master database, so that field staff do not need to be online. This is critical if they are based in remote areas with only sporadic access to the Internet. On the programme management side, Fintrac project and home office supervisors, as well as donor staff, can access real-time reports online through the programme's intranet.

Along with extensive use of ICTs, Fintrac stresses the application of the latest and most affordable agricultural field technology. CDA technicians utilize basic agronomic equipment to assist growers in improving their production systems and in problem solving. It is the combination of effective ICTs along with the latest field equipment and production methods that have contributed to the success of the programme for the benefit of Honduran smallholder farmers.

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Why extension needs to rise to the telecom policy challenge

Don Richardson argues that rural organizations involved in agricultural extension can no longer remain silent about their national telecommunications policies.

Numerous critiques of training & visit (T&V) and other technology transfer approaches have led to a chorus of calls for 'demand-driven extension'. At the same time, there is growing recognition that the needs of farmers and rural community members for information and appropriate learning methods are not being met. Demand-driven extension involves a shift from public sector service delivery to a negotiated system in which farmers and rural community members determine their own needs and have some control over the extension services delivered by public, private, NGO or farmers' organizations.

The calls for demand-driven extension have opened the door for an examination of how ICTs can be cost-effective and practical tools for facilitating and channelling farmers' demands, and for addressing how those demands can be met. However, forget, for a moment, about fancy ICT applications and wonderful new telecommunications technologies that might benefit agricultural extension. Those are the fruits of universal access, and they are grown and enjoyed most by people who have access to telecommunications networks.

To grow and enjoy those fruits, people in rural communities – and the organizations that serve them – must first have the fertile soil in which creative applications and innovative ways to use the technologies can flourish. In other words, there must be a telecommunications environment that supports access to national and international telecommunications networks in rural areas.

Creating that fertile soil is the major task ahead. Advocates of improved agricultural extension delivery must rise to the challenges of understanding and learning about the issues involved in telecom reforms, and advocating universal access policies. Only when access to telecommunications networks is a reality will rural stakeholders be able to use their creative energies and entrepreneurial spirit to identify potentially beneficial and sustainable ICT applications and practical ways to employ them.

Rural organizations involved in agricultural extension need to become proactively involved in shaping and monitoring national telecom policy. For many of these organizations, however, advocacy for telecom policy reform is certainly unknown territory. Is asking them to become involved in this policy area an impossible challenge? I don't think so. Take the following examples:

- In El Salvador the think tank-cum-advocacy group Foundation for Economic and Social Development (FUSADES) helped to push new concepts for telecom reform that went beyond the conventional approaches adopted elsewhere in Latin America. Their efforts have resulted in significantly increased rural telecom penetration.
- In Guatemala, the Center for National Economic Research and the Guatemalan Entrepreneurial Chamber provided targeted support to the effort to translate the concept of universal access into appropriate legislation. Again, as a result, access to the telecommunications infrastructure in rural areas has increased substantially.
- In Trinidad and Tobago, women were virtually excluded from the telecommunications decision-making process. The Network of Trinidad and Tobago NGOs for the Advancement of Women therefore launched national consultations related to universal access and women in the ICT sector. They successfully introduced the concept of 'sustainable human development values' as a central element in the debate with respect to the Telecommunications Bill 2000. The participants later formed their own network that continues to work as an advocacy group for rural telecommunications.

In general, rural and agricultural organizations are absent from national policy dialogues that help create and/or shape access to telecommunications networks in rural areas. The three examples above – and there are likely to be many more in other developing countries – demonstrate that rural organizations can indeed effectively influence national telecom policies. Their efforts can have a remarkable impact on rural access to telecommunications infrastructures and on the sustainable use of ICT applications that support agricultural development. Organizations need to make only modest investments to achieve this. In the case of the advocacy activities in Central America and the Caribbean, the costs ranged from US$10,000 to US$20,000.

The potential role of key ICT applications like the telephone and the Internet in agricultural extension will be severely limited as long as rural areas of developing countries are without access to the basic telecommunications services. This is because any resulting programmes and projects will be totally dependent on access to these services. Telecommunications policy therefore emerges as a primary enabler of or obstacle to demand-driven extension. Rural organizations involved in agricultural extension can no longer remain silent about their national telecommunications policies.

This article is based on a paper presented at CTA's ICT Observatory workshop, 23-25 September 2003.

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COLME: digital video instruction in the Caribbean

David Walker shows how digital video allows extension workers to reach larger numbers of farmers, at a time when extension services are being greatly reduced.

Stephen Duggins and his fellow extension officers have become local celebrities in rural St. Kitts. Armed with a digital video camera, Stephen travels through the island and produces instructional videos for farmers. He visits local crop farmers to record their concerns and to provide them with feedback about how they can improve crop yields and maximize profits. Back at his rural extension unit office, Stephen plugs the camera into a television set and edits his footage, so that it can be transferred to videotape and converted to any format. His broadcast-quality recordings will make the rounds with other local extension officers, and will be distributed to other farming regions.

Stephen is not alone – rural extension officers in Dominica, Grenada, Trinidad and Tobago, and Jamaica have also been taught how to use a camera and audio/video production skills to demonstrate new farming techniques and address local issues. Their new skills are the result of the Commonwealth of Learning Media Empowerment (COLME) programme, which was launched in 1999 to address issues in agriculture, forestry, the environment, health and education around the world. The initiative, supported by the Rural Agricultural Development Authority (RADA), is an example of COLME's Open and Distance Learning (ODL) model, which aims to promote the exchange of training and other information among farmers, extension officers and scientists.

The COLME programme activities in the Caribbean focus on fostering agribusiness opportunities and environmental sustainability. The aim is to assist governments in their efforts to move away from their traditional dependency on a single crop – such as bananas in Dominica or sugar in St Kitts and Nevis – and to support small farmers who have been sidelined by imports of mass-produced food products from developed countries.

Video: the most reliable medium

After studying the possibilities for the best Caribbean ODL model, COLME project members, together with local extension staff and farm groups, decided to opt for video, for a number of reasons. On many islands the hilly terrain tends to block radio signals, so that video is by far the most reliable medium. Moreover, visual information tends to be of greater value to farmers, since many of them already have television sets and video players. Most important, video allows extension workers to reach larger numbers of farmers, at a time when extension services are being greatly reduced. In Jamaica, for example, there was one extension officer per 500 farmers in 1990. Since then the number of extension officers has been reduced by more than 50%, while the number of farmers has increased. Yet, in order for extension officers to be able to reach farmers effectively, they need to be directly involved with gathering local content.

Simple video production goes a long way to meeting this requirement. Many extension officers, once they are familiar with the new user-friendly digital production equipment, enjoy the challenge and feel they have an important set of skills that supports their mandate of reaching farmers. The farmers in turn can directly relate to information that is relevant to their own region, valley, field and colleagues.

The COLME programme is going strong. In St Kitts, for example, the extension service has produced a video-based magazine for television, in which farmers are encouraged to adopt new techniques and to diversify production. In Jamaica, video-based extension information has been used at farmers' group meetings such as agricultural field days sponsored by the Ministry of Agriculture. In Tobago, video productions on the environment and forestry have been shown in local schools to make young people more aware of the importance of preserving wetlands.

It should be noted, however, that this initiative will only be sustainable if the region's agriculture ministries allow the role of the rural extension officer to change. Under the current system, trained field extension officers who are promoted are often transferred from their area of expertise and given administrative duties, creating a serious knowledge gap at field level. More initiatives such as the COLME programme are urgently needed to assist governments in finding new, effective strategies that will enable greater numbers of farmers to receive relevant information.

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Rainforest Literacy Project: interactive radio in Papua New Guinea

Douglas Bell and Micael Olsson explain how interactive radio programmes are helping tribes to save the rainforest and support their food and cash crop production in Papua New Guinea.

In the village of Itokama, in the fertile Oro Province of eastern Papua New Guinea, representatives of a dozen or so local clans have gathered for a strategy meeting. But this is no ordinary meeting. They have come to discuss how to manage and conserve their part of the rainforest, which is under threat from loggers and land developers. The members of this tribal 'land group' are gathered around a radio, listening attentively to a programme in Pidgin English. The programme and meeting's guiding principle is 'kuae-fie-nami' ('speak and understand each other'), meaning that the answers to land development problems lie in dialogue rather than in one-way initiatives.

Papua New Guinea's land groups have a long tradition of participating in local and regional consensus-building forums. This form of self-governance, an outstanding example of democracy at work, is key to their survival. Today, the land groups are faced with critical decisions about how to manage their land and balance cash crop and food production with sustainable conservation practices because their forests are under serious threat. About 6 million hectares, or 40% of the country's forested area, have been designated as potential logging tracts. Each year, some 180,000 hectares are logged, causing irreversible damage to the forest cover. Tribal land groups legally own the land on which they live, and outside developers must gain prior consent from them for any development plans. However, many landowners have been enticed by the money offered by large corporations in exchange for logging rights. The growing population and the need for income are pushing tribal peoples to expand their food and cash crop production, and younger generations are turning away from traditional forest conservation values and practices.

At this critical juncture, the Education Development Center (EDC) and the NGO Partners with Melanesians (PwM) have launched

the Rainforest Literacy Project for villagers on the Managalas Plateau in Oro Province. Funded by the Norwegian Rainforest Foundation, the initiative addresses the local need for land management skills and informed land management decisions. The project brings critical technical information and skills-building support to local farmers through an innovative, ICT-supported learning approach called Multichannel Learning.

Based on research that shows that people learn in various ways and through various means, and that the chances for successful learning are improved when more than one learning channel is used, Multichannel Learning reinforces its messages over and over through multiple media and in different settings. The approach therefore avoids the pitfalls encountered in earlier efforts to inform local farmers, which relied too heavily on extension workers with only a limited understanding, and printed materials that the marginally literate people found too difficult to follow.

At the core of the project is a series of 'interactive radio instruction' programmes that are broadcast during scheduled meetings of the land group forum. In an entertaining serial drama, actors portray colourful characters representing a variety of viewpoints on land development, forest conservation, family planning and other issues. Points of audience participation are built into the radio scripts – listeners are invited to answer questions posed by the actors. Most importantly, the broadcasts serve as launching points for facilitated discussions. The content of the radio programmes is repeated and reinforced in a variety of printed materials. These use simple vocabulary, with clear explanations and plenty of graphic symbols and illustrations that can be understood by the semi-literate audience. The materials are also distributed to students in schools, women's groups, and literacy and reading clubs.

Faced with the growing external and internal pressures to clear the precious rainforest, the land groups need to be able to make informed, well-planned land management decisions. The Rainforest Literacy Project complements traditional values of forest conservation with contemporary land management information and techniques. It does so within the existing system of community self-governance and utilizes Multichannel Learning to maximize its effectiveness. This can only help the land groups of Papua New Guinea to make informed decisions and take effective action to ensure the survival of the forest for future generations.

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Projects and initiatives

This section lists key projects and initiatives in the field of agricultural extension and ICTs. Additional information is available from the web magazine at *http://ictupdate.cta.int*.

AFRICA

Egypt: Virtual Extension Research Communication Network (VERCON) is using ICTs as tools to manage agricultural research agendas through a participatory process that includes researchers, extension staff, NGOs and small producers. Recognizing how technological and social networks interrelate and support each other, VERCON aims to ensure the flow of information from agricultural research through extension and ultimately to farmers themselves. In a VERCON project in Egypt four pilot research centres will be set up as the basis for a national agricultural knowledge and information network.
www.vercon.sci.eg/Vercon_en/vercon.asp

Ghana: AGRINET is the communication backbone for the **Agricultural Services Sub-sector Investment Programme (AgSSIP)**. The network is intended to improve the flow of information and communication among **Ministry of Food and Agriculture** offices, agricultural researchers, extension officers, students and universities. As part of AGRINET, a web-based **Agricultural Information System** is being developed for farmers, traders, researchers, and the public, both local and international.
www.balancingact-africa.com/news/back/balancing-act_93.html

Mali: Panos West Africa has set up a production studio in Mali that serves a network of 23 journalists in francophone Africa, who produce documentaries and educational programming for rural communities. So far, more than 100 documentaries have been produced and distributed to 100 independent community stations in West and Central Africa. Panos has compiled a **Radio Programme Bank**, a database of the radio programme materials, which are available on cassette or via the Internet for community radio stations to use directly or translate and assimilate into local programmes.
www.panos.sn/depts/radio.htm and *www.oneworld.org/panos_audio*

Uganda: Radio Apac is a community radio service in northern Uganda, broadcasting in the Luo language, from a radio station that fits in a suitcase. The package has earphones, a microphone, a mixer, two tape players and recorders, two CD players and a transmitter, as well as a hook-up to commercial FM networks and to satellite feeds for off-air programming. It broadcasts up to 50 km, runs on a car battery and can be modified for solar power. The components are available worldwide, which means that the radio station is relatively easy to operate. All for around US$3500, which is a fraction of the cost normally associated with radio broadcasting. The portable radio project is an initiative of the **Commonwealth of Learning Media Empowerment (COLME)** programme.
www.col.org/programmes/capacity/community_rv.htm and *http://radioapac.tripod.com/*

Uganda: Electronic Delivery of Agricultural Information to Rural Communities is a project that aims to improve access to agricultural information through the use of traditional and modern ICTs (the Internet, email, printed materials, radio, TV, video and CD-ROMs) to increase agricultural production. Telecentres in Buwama, Nabweru and Nakaseke (*www.nakaseke.or.ug/*) serve as resource centres, providing access to the **Agricultural Research Information Service (ARIS)**, education and training resources, reference materials, market information, e-commerce opportunities, and various advisory services. The project staff identify and acquire agricultural information, research results and indigenous knowledge from local and international sources, and repackage it into appropriate formats and languages. Training is provided for extension agents in the use and application of ICTs, business management and information repackaging. The project is a collaborative effort of the **National Agricultural Research Organisation (NARO)**, **CABI** and **IDRC**.
www.agricinfo.or.ug/

CARIBBEAN

Jamaica: The **Inter-American Institute for Cooperation on Agriculture (IICA)** offers a distance learning programme for farm managers, farm owners and agricultural technical support representatives through its **Caribbean Agro-Entrepreneurs Distance Learning Centre (CADLC)**. The courses (via the Internet or CD-ROM), developed in cooperation with **McGill University,** include Organic Farming for Entrepreneurs, Farm Management, and An Introduction to E-Commerce.
www.agroinfo.org/caribbean/iicacarc/jamaica/adltcnew.htm

ASIA & THE PACIFIC

India: The **National Institute of Agricultural Extension Management (MANAGE)** was set up in 1987 by the **Ministry of Agriculture** to respond to the challenges of management in the rapidly growing agricultural sector. MANAGE assists national and state governments and public sector organizations in effective management of their agricultural extension and other systems. MANAGE has set up a network of information kiosks, with an agricultural extension emphasis, to provide training in and access to ICTs for disadvantaged communities. The kiosks offer timely and relevant information on, for example, farmers' rights, loans and grants.
www.manage.gov.in/

Philippines: The **PinoyFarmer Business Development** project was initiated by the **Department of Agriculture**, in partnership with **Winrock International**, to develop a revitalized, ICT-supported extension service. The project aims to help local farming and fishing communities make sound business decisions and create new business opportunities. Farmers will be able to access information on new technologies and markets through radio and TV, and receive support for implementing innovations, including production of high value crops, new quality control methods, production, processing and packaging, and marketing.
www.pinoyfarmer.com

Q&A: Trends in agricultural extension and ICTs

Agricultural extension finds itself at a time of crisis. Many of today's agricultural extension services are suffering under bureaucratic centralized management structures. Squeezed by decentralization policies, diminishing public funds and the privatization of public services, they are urgently in need of change. To what extent can ICTs help shake off the yoke of training & visit (T&V) programmes and help to reinvent agricultural extension? Will ICTs alter the kind of information that is being disseminated to farmers?

These and related questions were the central themes of CTA's ICT Observatory workshop 'ICTs – transforming agricultural extension?' in September 2003. Among the participants were **Joseph Kiplang'at** of Moi University in Kenya; **Ricardo Ramirez** of the TeleCommons Development Group; **Tunji Arokoyo** of ABU/IAR in Nigeria; **Marc Bernard** of InfoSys; **Clare O'Farrell**, communication for development officer at FAO; and **Ajit Maru**, a research officer at ISNAR. Here are some brief excerpts from their discussions.

What processes are currently shaping agricultural extension in ACP countries?

Joseph Kiplang'at: Decentralization – the delegation of services from central government to regional and local authorities – is already having a major impact on agricultural extension. With the rationalization of public sector staff, the ratio of extension workers to farmers is rapidly worsening. At the same time, ICTs are becoming increasingly important because they enable extension workers to reach many more farmers simultaneously.

Clare O'Farrell: Privatization is another key development, in which agricultural information is rapidly becoming a 'commodity'. This process directly impacts the different kinds of information and services that are made available to farmers – with a strong bias towards information that meets the needs of wealthier farmers.

Ricardo Ramirez: We can expect to see a range of information service delivery systems that respond to the needs of different types of natural resource users. We can expect a division between privatized extension systems that serve farmers who produce cash crops, and small public extension systems for those who do not. A third type of extension system will address environmental stewardship and collaborative resource management. The first system will address farm challenges and will follow a demand-driven and contractual approach, focusing on production, processing and marketing. The second system will focus on community challenges and may follow a 'sustainable livelihoods' approach, looking at how to support existing multiple survival strategies, not just production-oriented ones. The third type of extension system will address watershed/ecosystem challenges and embrace collaborative management approaches.

How might these processes affect the use of ICTs by extension workers or their clients?

Marc Bernard: A decentralized working environment promotes the use of ICTs. First, ICTs lower the transaction costs for existing services. Second, they will improve efficiency, as extension workers can use modern media as everyday tools to step up their networking activities. Eventually, ICTs may help to replace existing hierarchical organizational structures with more flexible and decentralized networks of agricultural extension experts who can liaise directly with clients, according to demand and on an individual basis.

Tunji Arokoyo: Privatization and decentralization represent positive developments in many ways, but we are also seeing some unexpected negative impacts. In Nigeria, for example, the decentralization of agricultural farm radio programmes took place at the same time as the privatization of state radio broadcasting stations. These stations then started to charge commercial prices for radio broadcasting time-slots. Many of the decentralized farm radio programmes, with much smaller budgets than those of the former national programmes, could simply not afford those prices. As a result, most Nigerian farm radio programmes were discontinued.

Ajit Maru: Also, as Ricardo pointed out, broader access to more sophisticated and integrated ICTs will require new services, which are not provided at present by public sector agricultural extension systems. The entry of the private sector in agricultural information and knowledge sharing at the local and global levels will change current communication concepts in agricultural extension. In particular, the existing 'stand alone' agricultural extension institutions that depend on T&V and similar linear information flows, and provide only agronomic advice, will not survive. Their place will be taken by institutions and organizations that effectively use information flows, especially through ICTs, to add economic as well as social and political value to both individual and communal activities.

For a summary of the online discussions, visit *www.cta.int/observatory2003/ppt_presentations/e_consultations.pdf.*

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